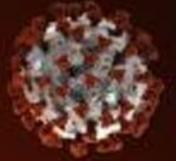
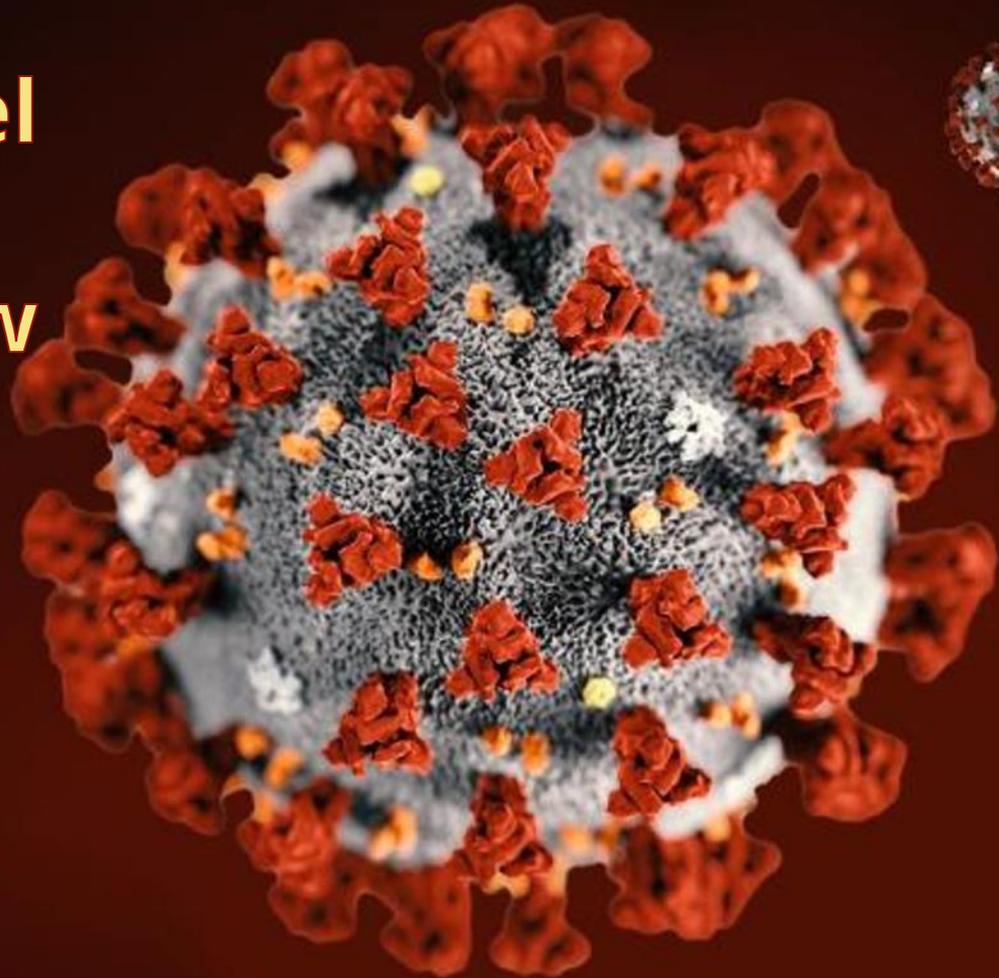


The 2019 Novel Coronavirus: What We Know



Department of
Public Health
CITY OF PHILADELPHIA

Overview

What is the 2019 Novel Coronavirus? (COVID-19)

Symptoms

Transmission

Disease Burden

- Comparison of risk: Influenza vs. Coronavirus
- Other coronavirus outbreaks

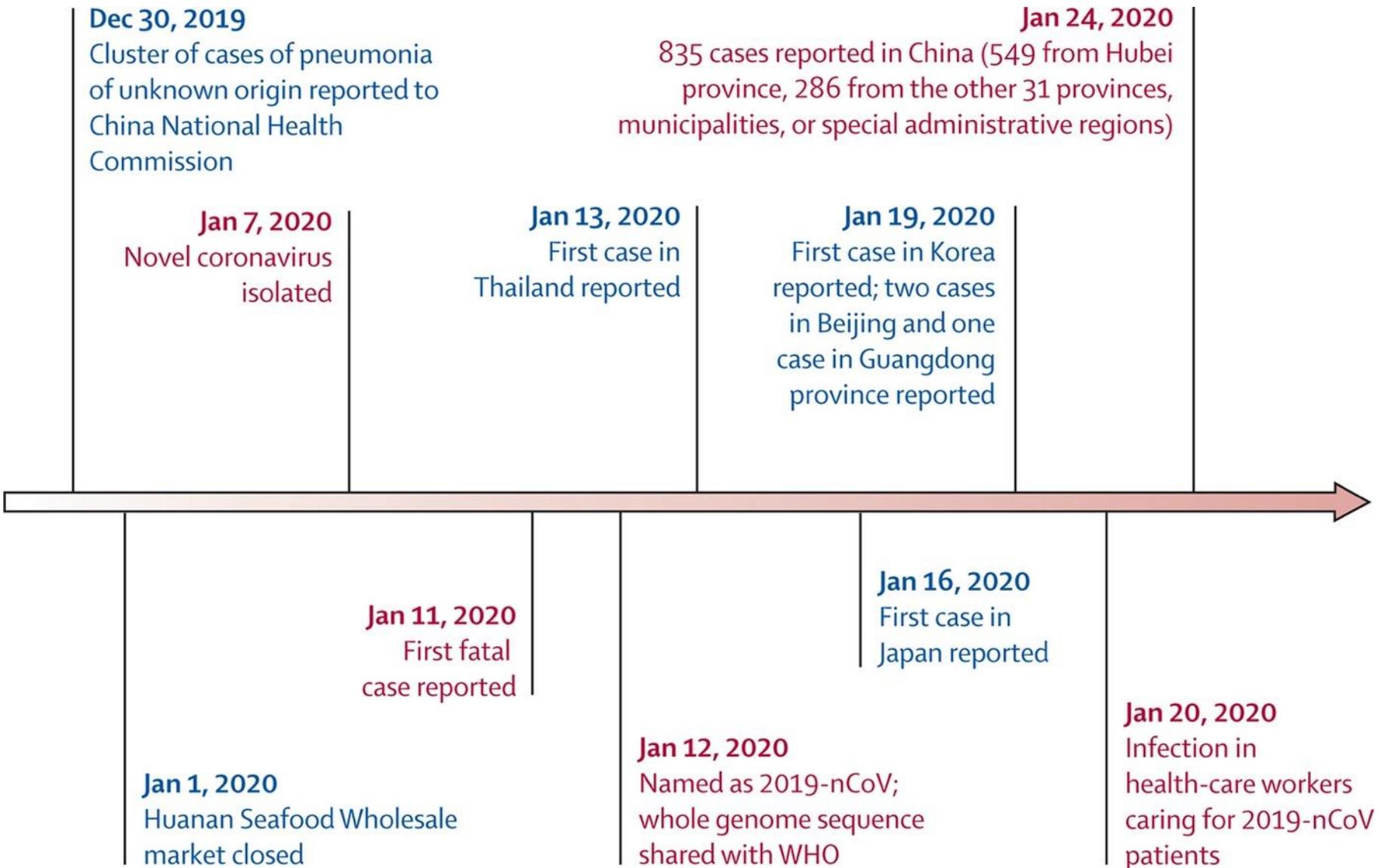
Management

Prevention

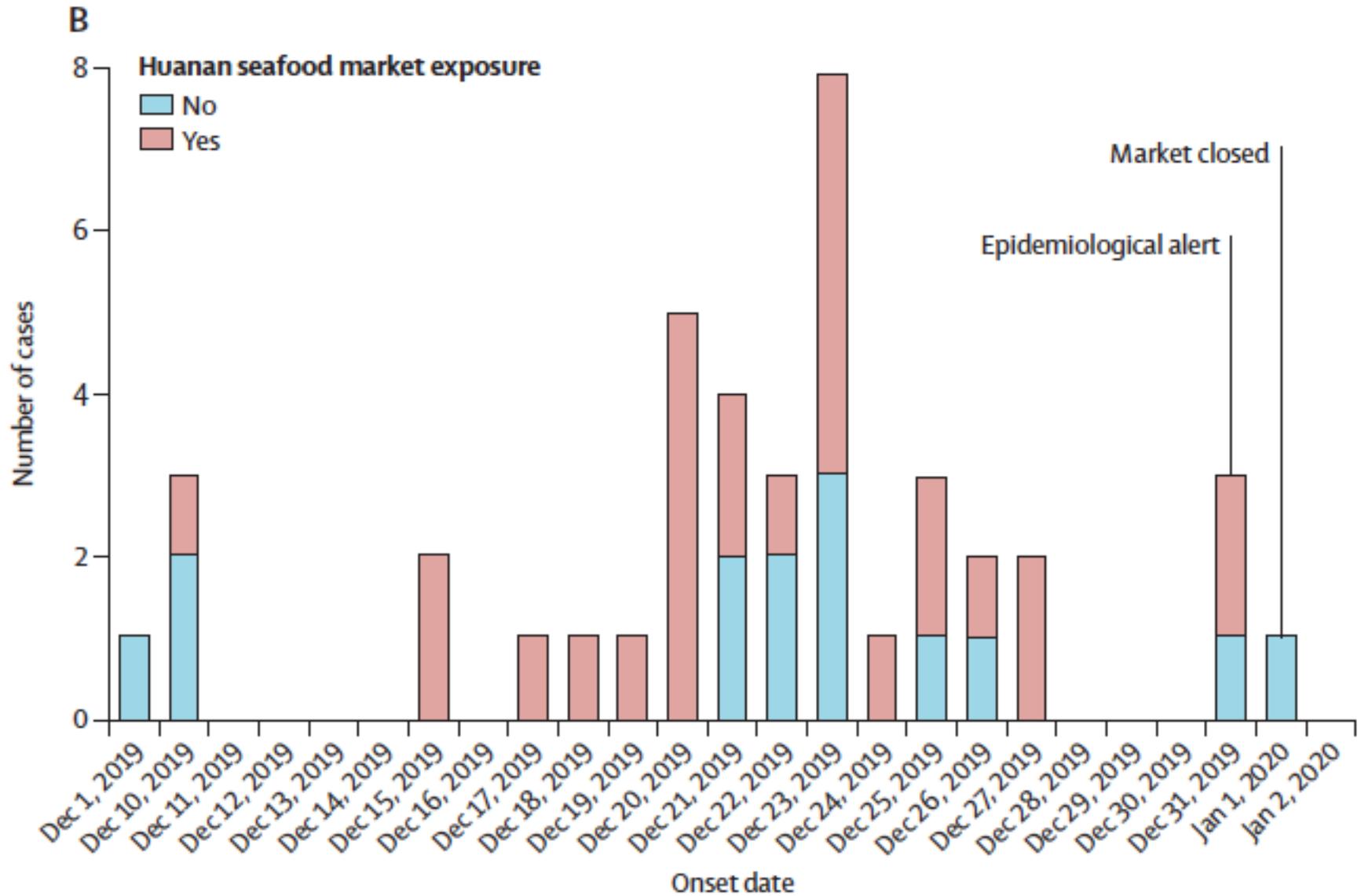
Resources

Background:

- A cluster of pneumonia of unknown etiology was detected in December 2019 in Wuhan City, Hubei Province, China
- Initial cases linked to seafood and live animal market in Wuhan City
- Outbreak quickly grew to several hundred cases over the first half of January
 - *Including individuals without contact with animal market*



Case series, first 41 admitted patients, Dec 2019-Jan 2020



Outbreak update:

Case Count as of 3/5/20:

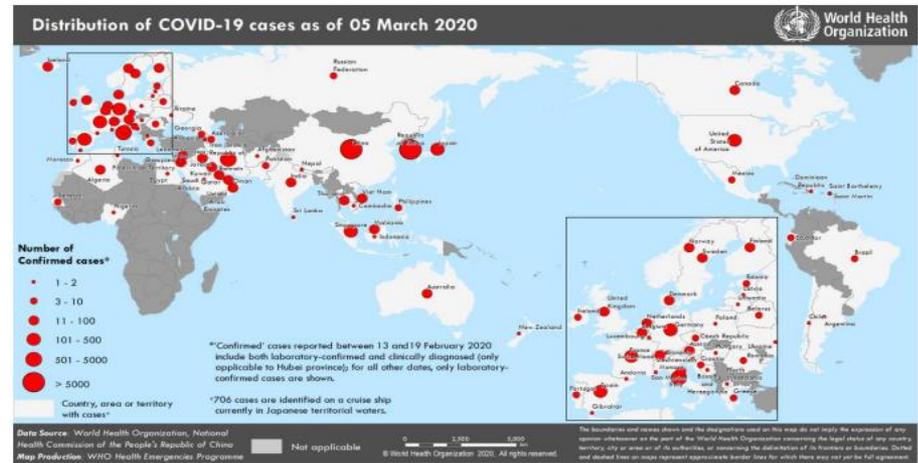
Globally

- 95,333 confirmed (2241 new)

China

- 80,565 confirmed (143 new)
- 3015 deaths (31 new)

Figure 1. Countries, territories or areas with reported confirmed cases of COVID-19, 05 March 2020



Outside of China

- 14,768 confirmed (2098 new)
 - 85 countries (8 new)
 - 267 deaths (13 new)
-
- South Korea, Japan, Iran and Italy now with Level 2 or 3 travel alerts

Figure 3. Epidemic curve of COVID-19 cases (n=338) identified outside of China, by date of onset of symptoms and likely exposure location, 27 February 2020

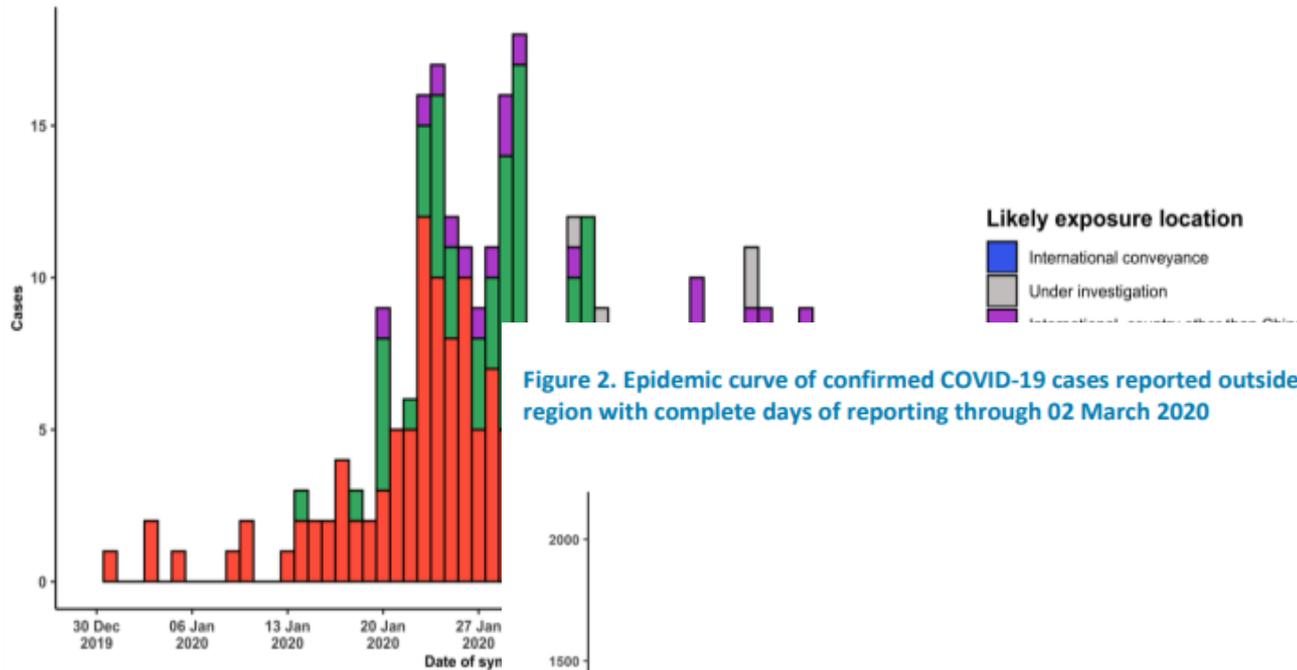
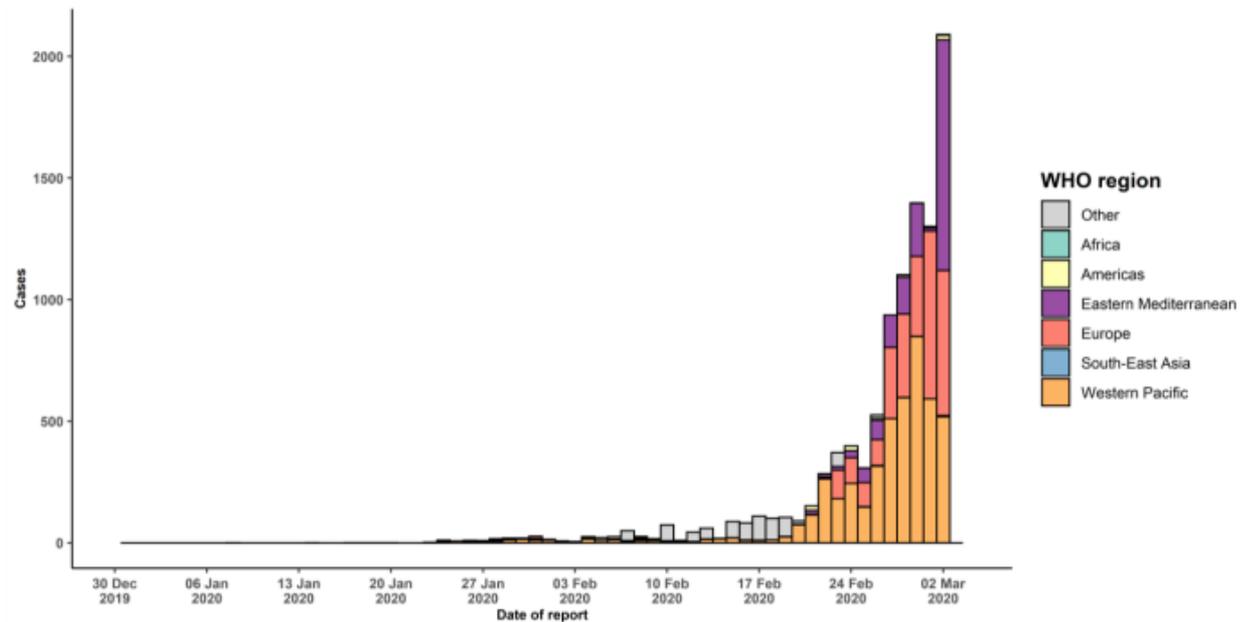


Figure 2. Epidemic curve of confirmed COVID-19 cases reported outside of China, by date of report and WHO region with complete days of reporting through 02 March 2020



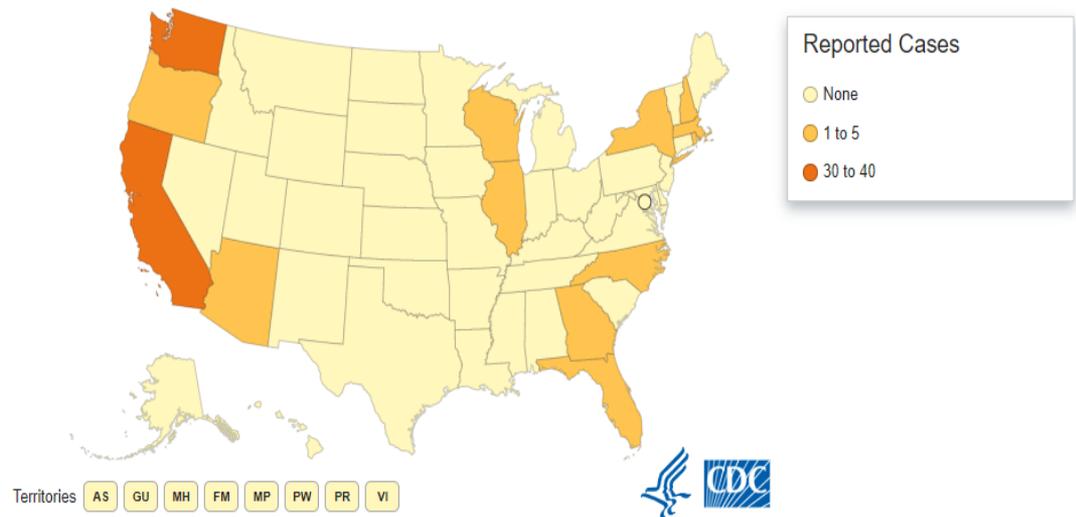
Note for figure 2: Of the 3664 cases reported the remaining 3572 cases, information on date of onset is missing, therefore not included in the epidemic curve.

Outbreak: U.S. (as of 3/5)

- 99 total cases + 49 cases among repatriated persons
- 10 deaths
- 13 states → 2 presumptive cases in PA

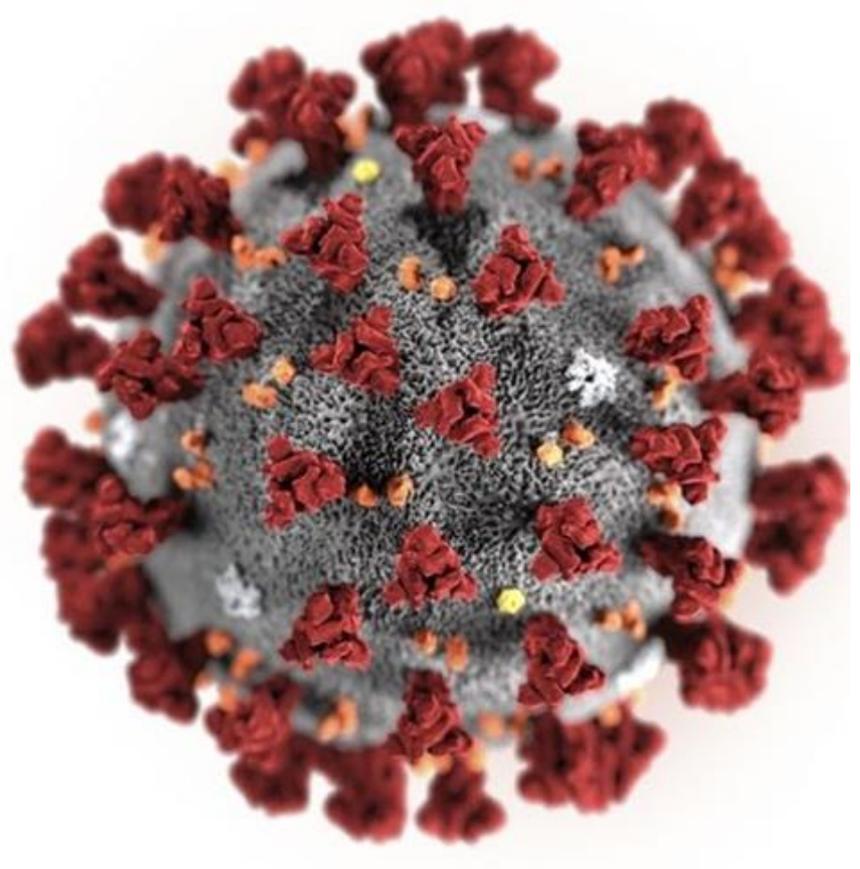


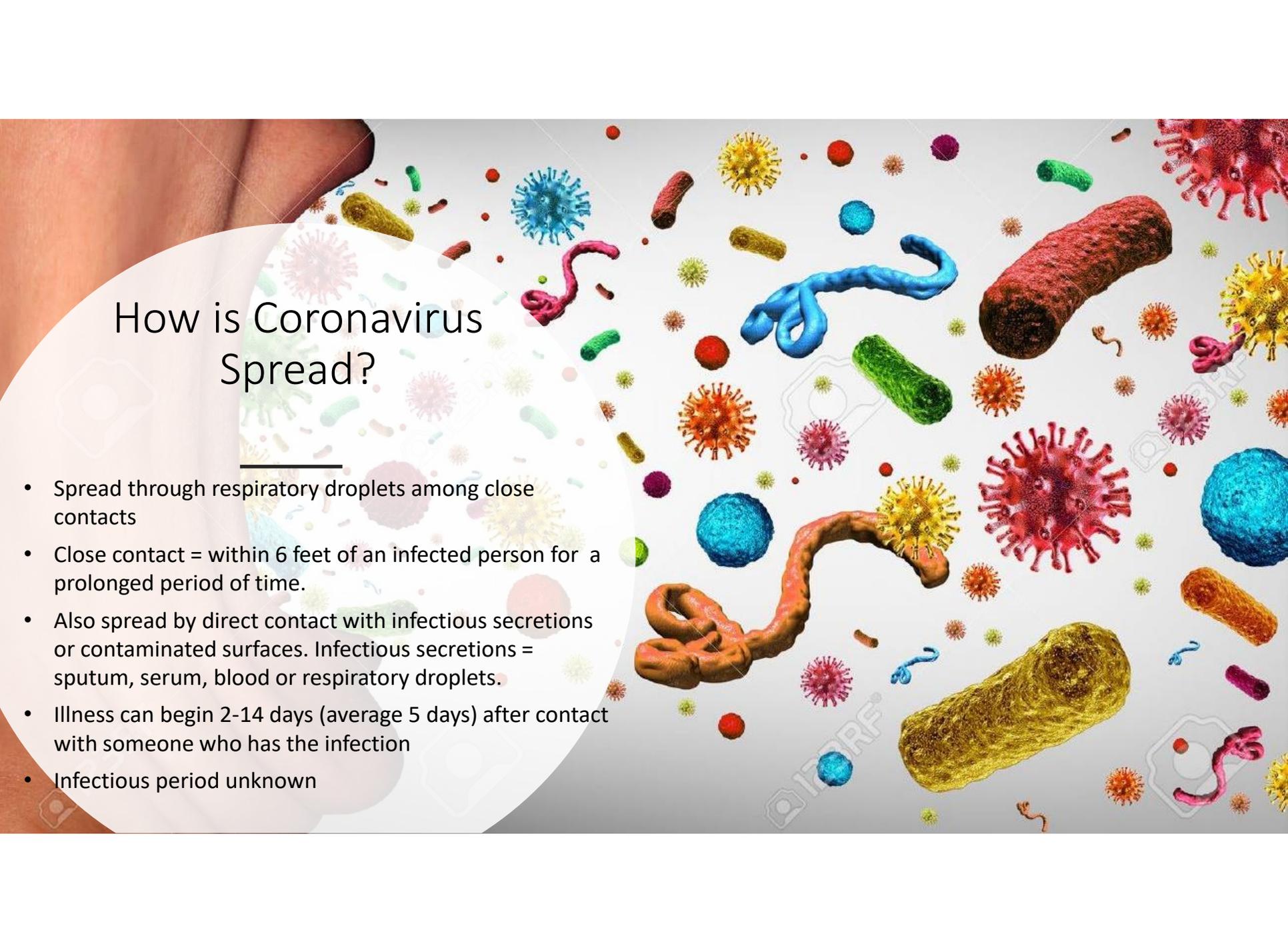
States Reporting Cases of COVID-19 to CDC*



What Are Coronaviruses?

- A large family of respiratory (and less commonly, gastrointestinal) viruses that can infect both people and animals, including cats, chickens, mice, cattle and other ruminants and bats.
- Rarely, animal coronaviruses can develop mutations that allow them to infect humans exposed to infected animals, and then spread among people, as has been seen with [MERS-CoV](#) and [SARS-CoV](#), and **now COVID-19**.





How is Coronavirus Spread?

- Spread through respiratory droplets among close contacts
- Close contact = within 6 feet of an infected person for a prolonged period of time.
- Also spread by direct contact with infectious secretions or contaminated surfaces. Infectious secretions = sputum, serum, blood or respiratory droplets.
- Illness can begin 2-14 days (average 5 days) after contact with someone who has the infection
- Infectious period unknown



- Each infected person could spread coronavirus to 1.5 - 3.5 people without effective containment measures.
- Highest risk may be among very close (i.e. household) contacts
 - Attack rate 0.45% among all close contacts of infected returning travellers vs 10% among household contacts

Clinical presentation

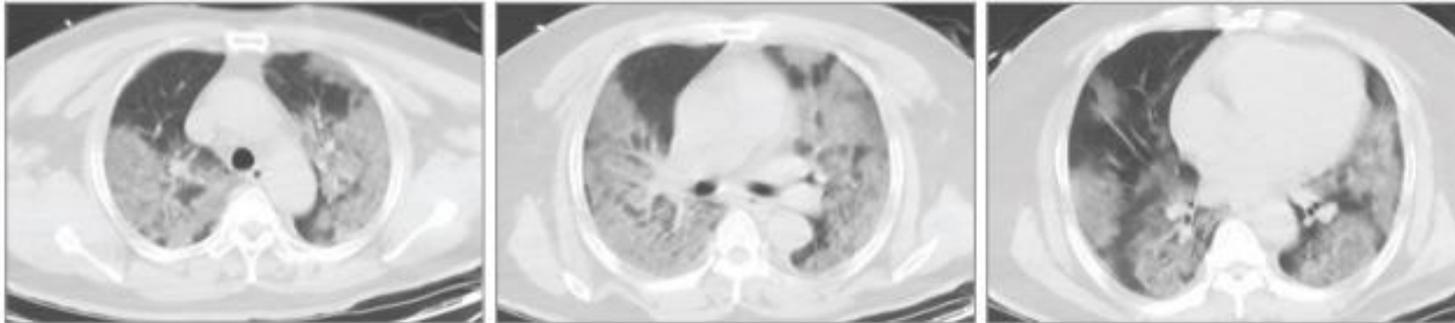
- Limited initial data
 - Mostly adult case series
 - Young children may be less likely to experience severe disease
- Predominantly affecting male, older patients with comorbid conditions
- Prodromal fever and fatigue may precede respiratory sx
- Possible presentation with predominant GI symptoms

Signs and symptoms	
Fever	136 (98.6)
Fatigue	96 (69.6)
Dry cough	82 (59.4)
Anorexia	55 (39.9)
Myalgia	48 (34.8)
Dyspnea	43 (31.2)
Expectoration	37 (26.8)
Pharyngalgia	24 (17.4)
Diarrhea	14 (10.1)
Nausea	14 (10.1)
Dizziness	13 (9.4)
Headache	9 (6.5)
Vomiting	5 (3.6)
Abdominal pain	3 (2.2)

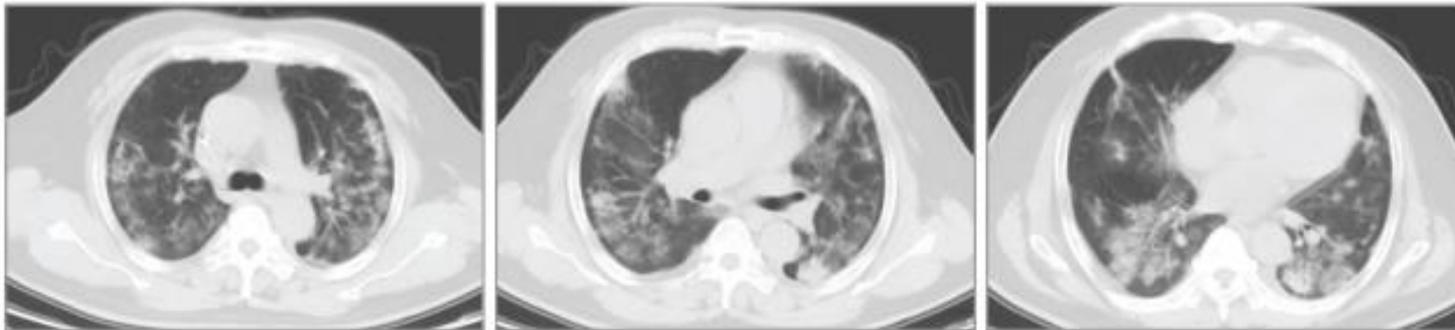
ARDS ~8 days after onset

Figure 1. Chest Computed Tomographic Images of a 52-Year-Old Patient Infected With 2019 Novel Coronavirus (2019-nCoV)

A Computed tomography images on day 5 after symptom onset



B Computed tomography images after treatment on day 19 after symptom onset



A, Chest computed tomographic images obtained on January 7, 2020, show ground glass opacity in both lungs on day 5 after symptom onset. B, Images taken on January 21, 2020, show the absorption of bilateral ground glass

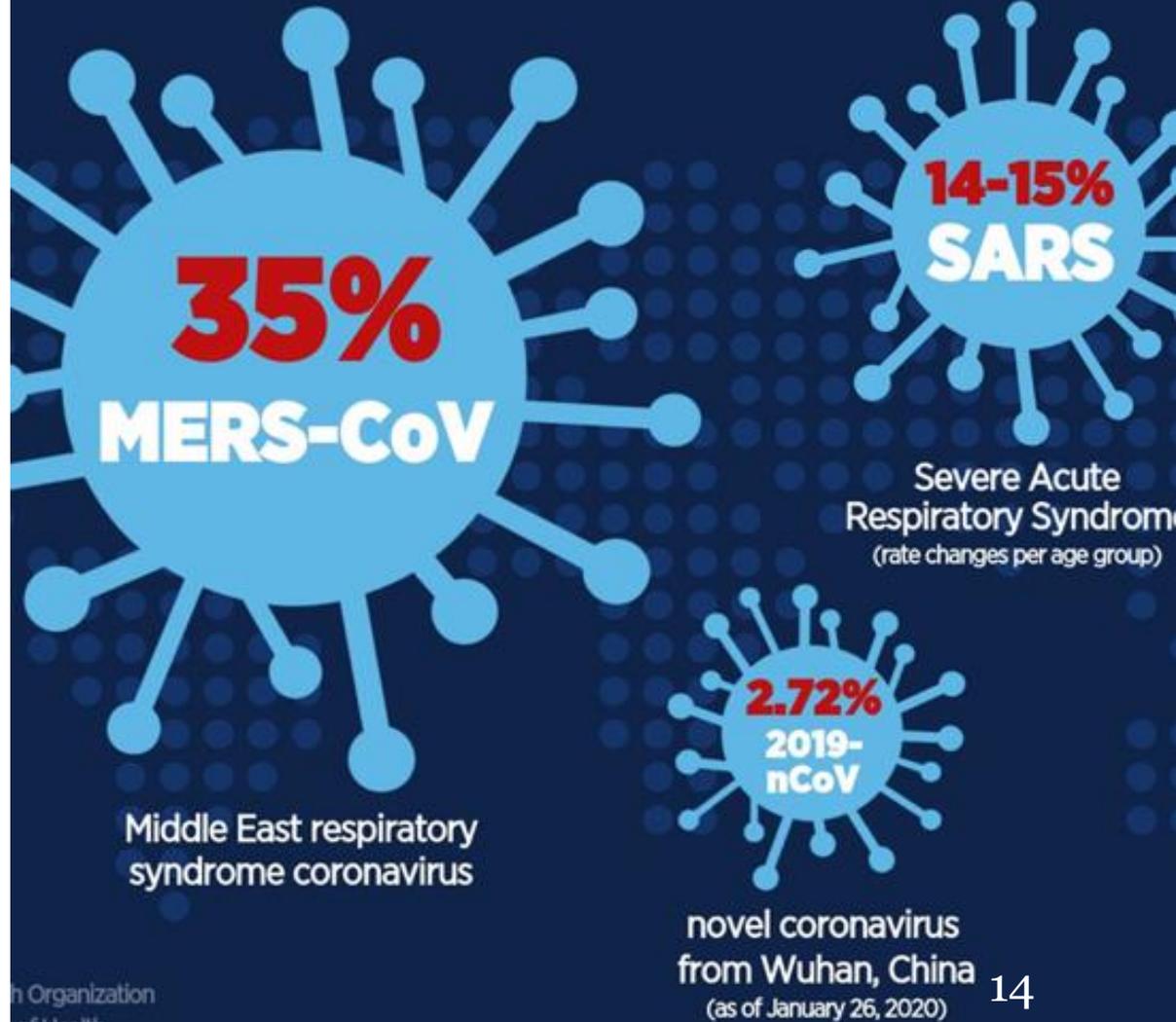
opacity after the treatment of extracorporeal membrane oxygenation from January 7 to 12 in the intensive care unit.

(1) Wang D, Hu B, Hu C, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus–Infected Pneumonia in Wuhan, China. *JAMA*. Published online February 07, 2020.

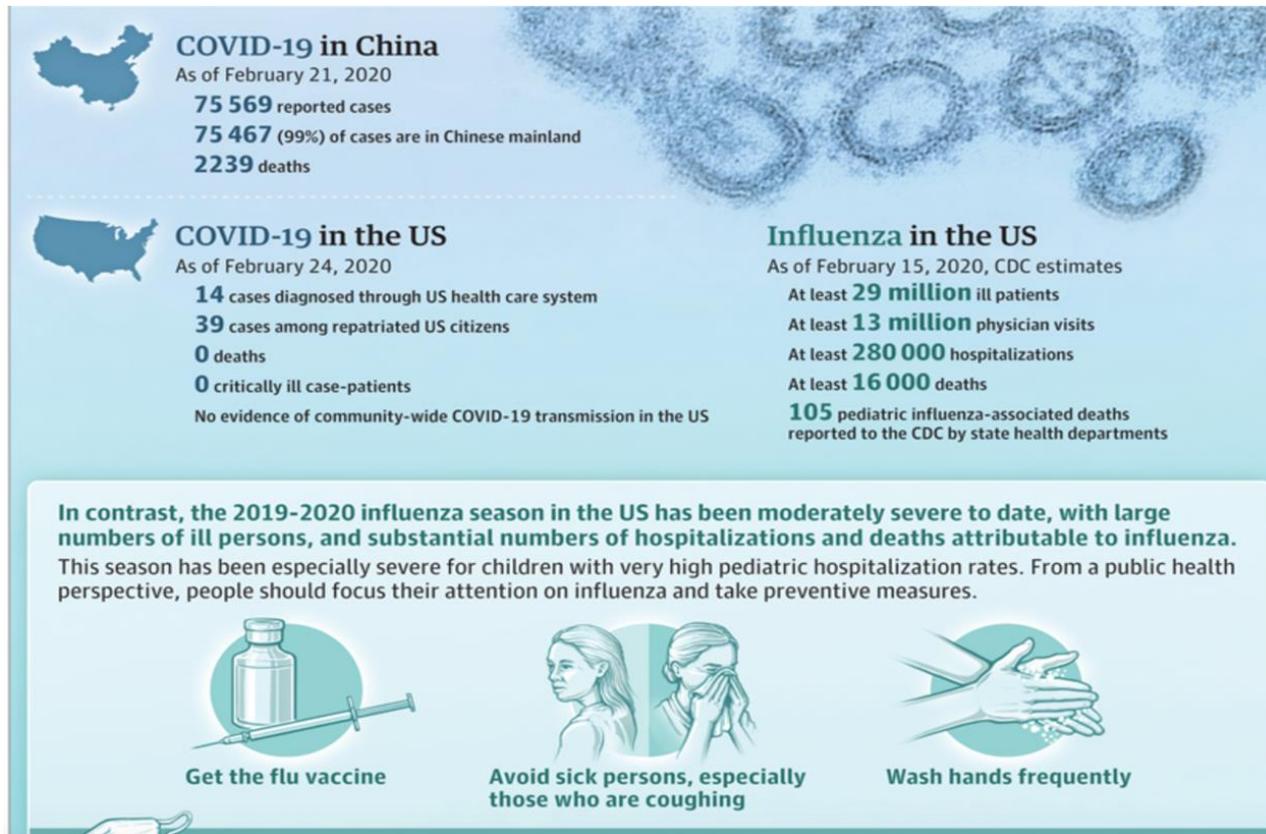
Outcomes

- 20% of diagnosed cases “severe”
- ARDS appears to be a later complication
 - ~8 days after symptoms onset
- 2.0-2.3% case fatality rate in initial case series

FATALITY RATES of severe human coronaviruses



Comparison: Flu in the US



Comparison of Recent Infections: Pathogenicity and Transmissibility

Table 1. Pathogenicity and Transmissibility Characteristics of Recently Emerged Viruses in Relation to Outbreak Containment.

	Virus	Case Fatality Rate (%)	Pandemic	Contained	Remarks
<u>December 2019</u> →	2019-nCoV	Unknown*	Unknown	No, efforts ongoing	
<u>2009 swine flu</u> →	pH1N1	0.02–0.4	Yes	No, postpandemic circulation and establishment in human population	
<u>2013 Bird flu</u> →	H7N9	39	No	No, eradication efforts in poultry reservoir ongoing	
<u>2003</u> →	NL63	Unknown	Unknown	No, endemic in human population	
<u>2002</u> →	SARS-CoV	9.5	Yes	Yes, eradicated from intermediate animal reservoir	58% of cases result from nosocomial transmission
<u>2012 & 2019</u> →	MERS-CoV	34.4	No	No, continuous circulation in animal reservoir and zoonotic spillover	70% of cases result from nosocomial transmission
<u>Since 1976, 26 outbreaks</u> →	Ebola virus (West Africa)	63	No	Yes	

* Number will most likely continue to change until all infected persons recover.

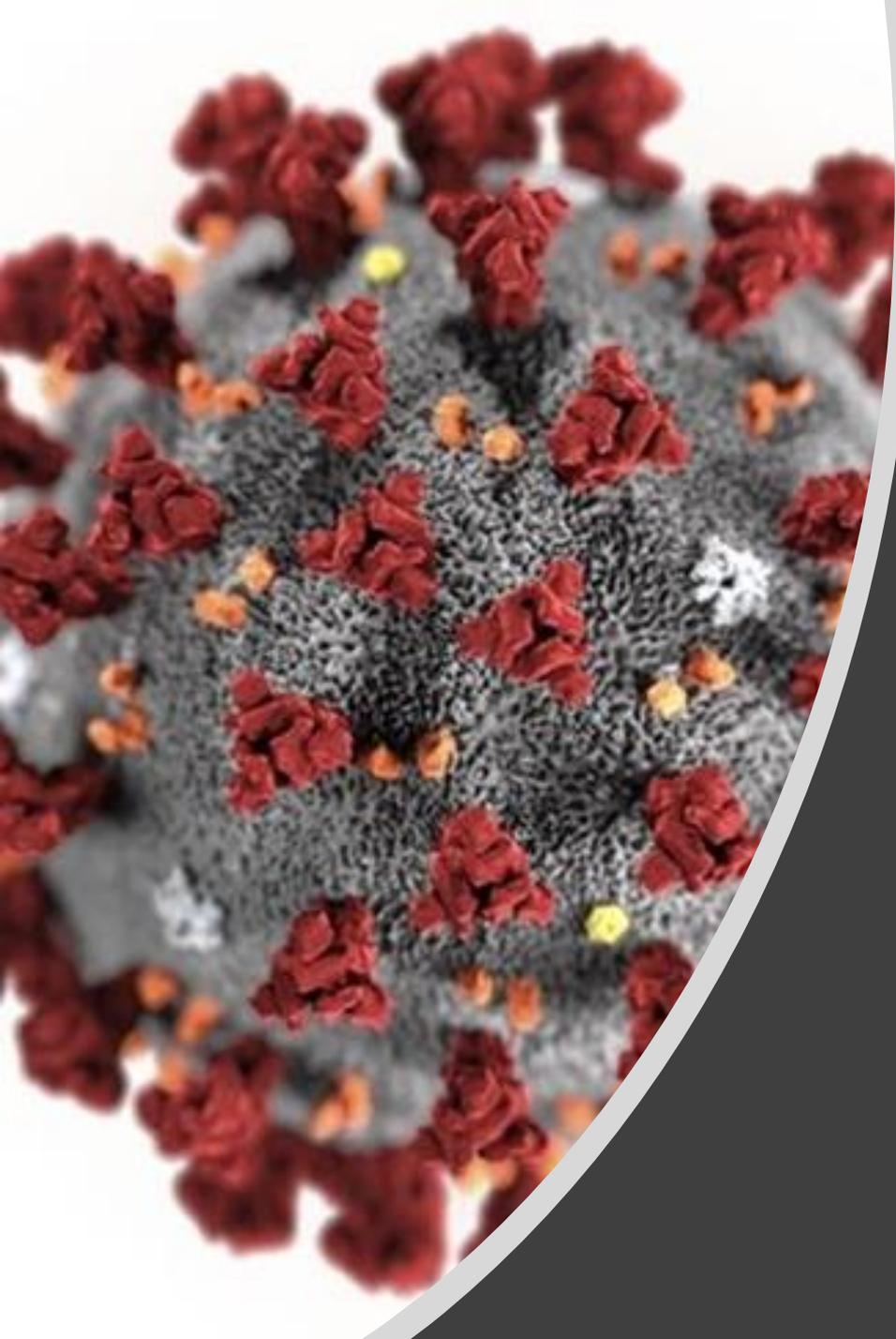
Clinical Management

- CDC and WHO guidance:
 - *supportive care*
 - *no clear evidence of utility of antiviral agents- clinical trials in process for lopinavir / ritonavir, chloroquine and ribavirin*
 - *recommend against use of corticosteroids, predominantly based on data from SARS and MERS*
- Ongoing questions...
 - *Length of contagious period in symptomatic persons*
 - *Frequency of asymptomatic transmission*

Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected

Interim guidance
28 January 2020

17



Case Identification, Containment and Mitigation

How Agencies Are Working to Prevent the Spread of COVID-19

- Travel screening
- Testing
- Quarantine
- Isolation
- Contact tracing
- Airborne/respiratory precautions
- PPE when caring for sick people
- Social distancing



Monitoring at risk persons

High Risk:

- Living with someone or providing care in the home for someone who has 2019nCoV without use of recommended precautions

Medium Risk:

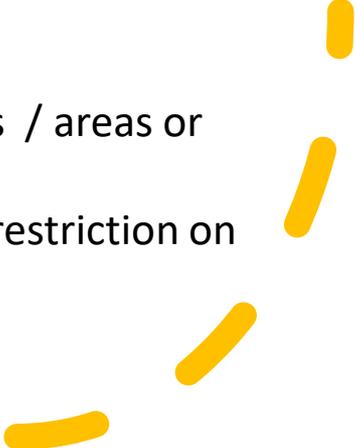
- Close contact with a person with confirmed 2019nCoV but using recommended precautions
- Travel from affected areas (Level 3 travel alerts)

Low Risk:

- Being in the same indoor environment (a classroom) with someone who has symptoms but not a close contact



Current Guidance: Monitoring At Risk Persons

- Close contacts of cases without appropriate PPE (high risk)
 - Quarantine with no public activities
 - Daily symptom monitoring
 - Returning travelers from affected countries (Level 3 Travel Alerts)
 - Passenger monitoring for travelers returning from China and Iran- one time contact
 - Travelers returning from Italy and South Korea receive guidance to self-monitor for symptoms
 - All returning travelers from affected countries advised to limit activity (i.e. stay home from work or school) for 14 days
 - Returning travelers from other countries / areas or other low risk exposures
 - Self-monitor for symptoms with no restriction on activities
- 

Person Under Investigation Definition

Clinical Features	&	Epidemiologic Risk
Fever ¹ or signs/symptoms of lower respiratory illness (e.g. cough or shortness of breath)	AND	Any person, including health care workers ² , who has had close contact ³ with a laboratory-confirmed ⁴ COVID-19 patient within 14 days of symptom onset
Fever ¹ and signs/symptoms of a lower respiratory illness (e.g., cough or shortness of breath) requiring hospitalization	AND	A history of travel from affected geographic areas ⁵ (see below) within 14 days of symptom onset
Fever ¹ with severe acute lower respiratory illness (e.g., pneumonia, ARDS) requiring hospitalization ⁴ and without alternative explanatory diagnosis (e.g., influenza) ⁶	AND	No source of exposure has been identified

Affected Geographic Areas with Widespread or Sustained Community Transmission

Last updated February 26, 2020

- China
- Iran
- Italy
- Japan
- South Korea

Person Under Investigation Definition

Clinical Features	&	Epidemiologic Risk
Fever ¹ or signs/symptoms of lower respiratory illness (e.g., cough or shortness of breath)	AND	Any person working with health care workers ² , who has been in contact ³ with a laboratory-confirmed patient within 14 days of symptom onset
Fever ¹ and signs/symptoms of lower respiratory illness (e.g., cough or shortness of breath) requiring hospitalization		Any person who has been in affected geographic areas ⁵ within 14 days of symptom onset
Fever ¹ with severe acute lower respiratory illness (e.g., pneumonia, ARDS) requiring hospitalization and no alternative explanatory diagnosis (e.g., bacterial pneumonia)		The source of exposure has been identified
<h2>Affected Geographic Areas</h2> <p><i>Last updated February 2020</i></p> <ul style="list-style-type: none"> • China • Iran • Italy • Japan • South Korea 		

New PUI Guidance (as of 3/4/2020)

- “Clinicians should use their judgment to determine if a patient has signs and symptoms compatible with COVID-19 and whether the patient should be tested. Decisions on which patients receive testing should be based on the local epidemiology of COVID-19, as well as the clinical course of illness.”
- High index of suspicion / high priority for testing
 - Exposure risk factors including close contact with a confirmed COVID-19 case OR travel to an affected area within 14 days
 - At risk for severe disease (older persons, chronic medical conditions)
 - Residence in a congregate setting
 - Severe acute respiratory illness with no apparent cause
- Prioritize testing for persons with high index of suspicion
- Also test for other respiratory viruses

What can clinic and urgent care providers do to prevent transmission in the community

- Provide safe and effective care to our patients
- Provide safe workplace for our colleagues



ATTENTION

IF YOU HAVE RECENTLY TRAVELED



**AND YOU ARE FEELING SICK WITH:
FEVER, COUGH, AND/OR TROUBLE BREATHING**



PLEASE TELL STAFF IMMEDIATELY

 Department of
Public Health
CITY OF PHILADELPHIA

STEP 1:
Screening
for
influenza-
like illness
AND travel
upon entry
into the
practice

Post signs in highly
visible locations at all
entrances

Provide surgical masks
and alcohol hand gel
adjacent to signs

Patients with
respiratory
symptoms should
put on mask and
perform hand
hygiene

Symptomatic patients
who report travel to an
affected area within 14
days OR contact with a
known COVID-19 case
should be escorted
promptly to a patient
room

STEP 2: Prevent Transmission in Waiting Areas

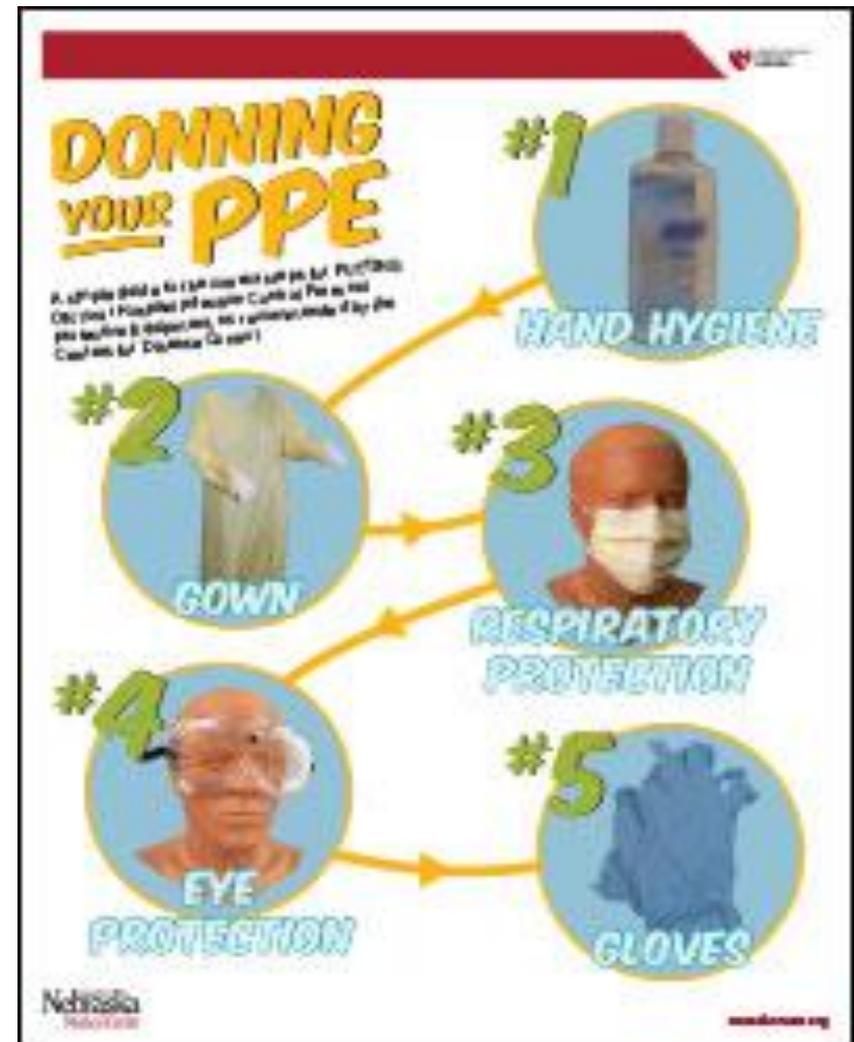
- Post hand hygiene and cough etiquette signs in waiting areas
- Provide ample supplies of tissues, alcohol hand gel, and waste cans in waiting areas
- Patients must cover cough and dispose of tissues promptly



STEP 3: Protect Yourself by Using Appropriate PPE when evaluating patients

When providing face-to-face care to patients with suspected COVID-19:

- Perform hand hygiene
- Put on gown, N95 mask, eye protection
- Perform hand hygiene
- Put on gloves



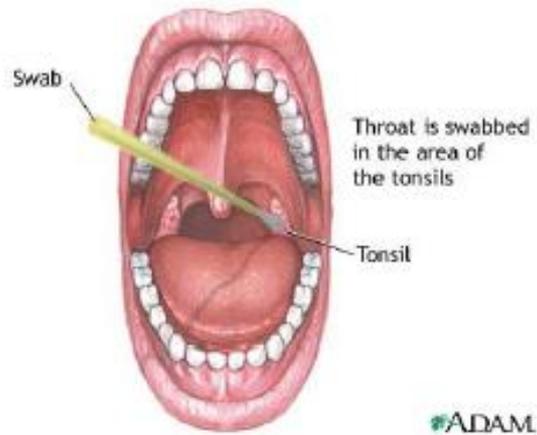
STEP 4: Protect Yourself by Removing PPE Safely

- Don't inoculate yourself while removing personal protective equipment
 - Remove gloves
 - Perform hand hygiene
 - Remove mask
 - Perform hand hygiene



CDC Recommended Management

- Appropriate isolation and PPE
 - CDC: contact, airborne and droplet
 - WHO: contact and droplet (N95 masks for aerosol generating procedures)
- **Call health department to report suspected case and discuss testing***
- Respiratory sample (nasopharyngeal and oropharyngeal) for nCoV PCR *and* other respiratory viruses



*testing is expanding to commercial laboratories

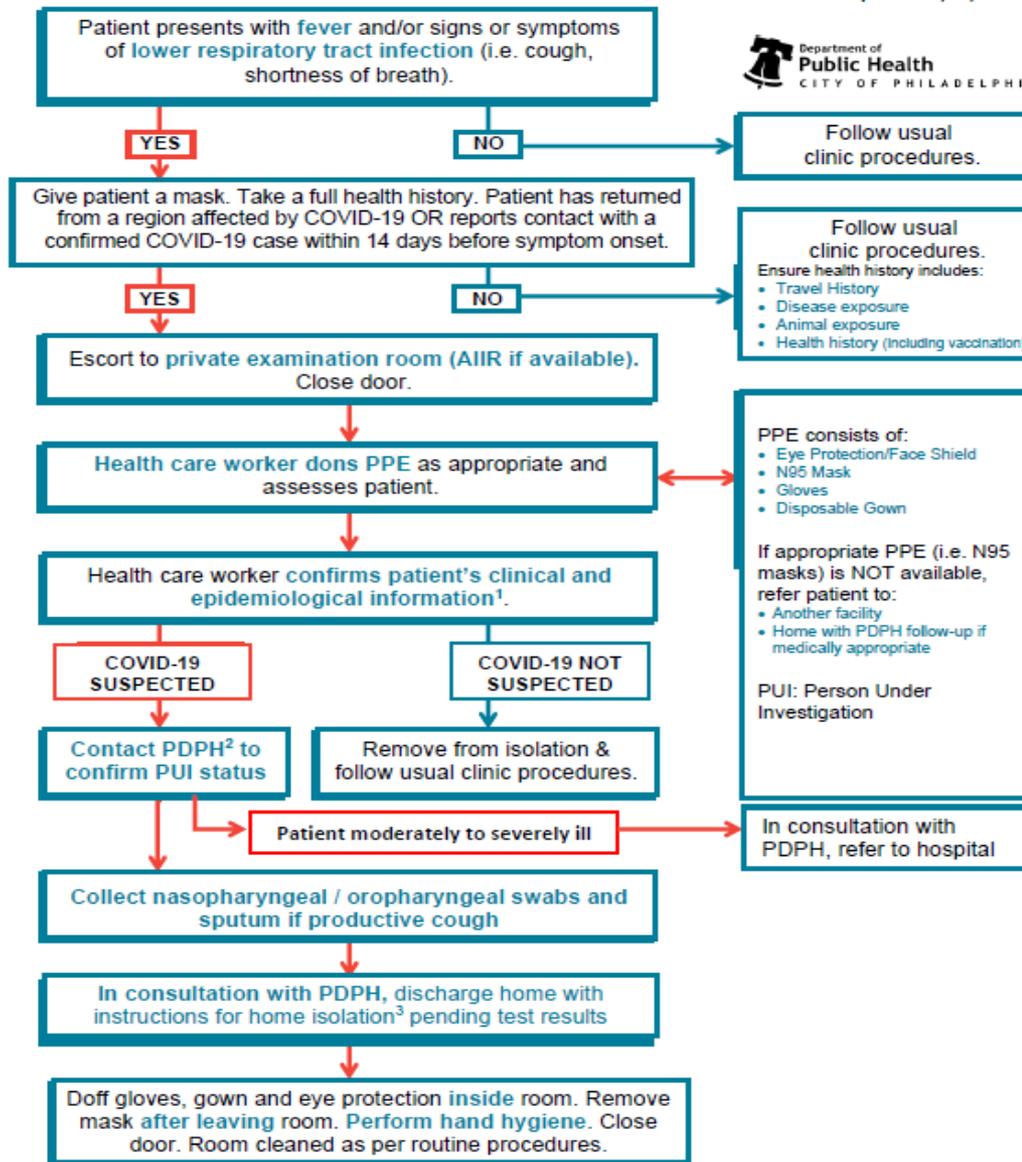


Environmental Cleaning

- Routine cleaning and disinfection procedures for patient room
 - Use EPA-approved products, ideally with claims against emerging respiratory pathogens or human coronaviruses
- Clean and disinfect nondisposable medical equipment
- Routine procedures for laundry and medical waste
- Clean and disinfect high touch surfaces in common areas often

Screening Patients for Suspected 2019 Novel Coronavirus (COVID-19) in Outpatient Healthcare Settings

Updated: 2/27/2020



STEP 5: Protect Your Coworkers and Patients

- Do NOT come to work when you have a febrile illness
- Review sick leave policies to facilitate absences due to illness

GOT THE FLU?



STAY HOME.

What happens if I (or my staff) are exposed to a confirmed or suspected COVID-19 case?

<p><u>High Risk of Exposure:</u></p> <ul style="list-style-type: none">• HCPs who perform or are present in room for aerosol generating procedures with unprotected eyes, nose or mouth Or• HCPs with no PPE or facemask who have prolonged close contact with COVID-19 patient who is not wearing a face-mask	<ul style="list-style-type: none">• Daily symptom monitoring• 14 day work exclusion
<p><u>Medium Risk of Exposure:</u></p> <ul style="list-style-type: none">• HCPs not using PPE or not wearing a mask when a COVID-19 patient who <u>is</u> wearing a mask• HCPs with unprotected eyes, nose or mouth AND prolonged close contact with a case (with or without a facemask)	<ul style="list-style-type: none">• Daily symptom monitoring• 14 day work exclusion
<p><u>Low Risk of Exposure:</u></p> <ul style="list-style-type: none">• HCPs using appropriate PPE during patient care• HCPs who have brief interactions with case• HCPs who are wearing everything except gown or gloves (unless extensive body contact, aerosol)	<ul style="list-style-type: none">• Self-monitor for symptoms under supervision of occupational health• No work exclusion

Step 6:
Prepare your
practice for
increased
patient
volume



Inventory your personal protection equipment supplies and review recommendations to preserve masks



Review your clinic's emergency plan for alternative staffing and surge capacity plans



Explore capability to use phone triage or patient portals to encourage patients with mild illness to stay home



Explore telemedicine options



How to Preserve PPE Supplies

- Limit number of staff involved in direct patient care of suspected or confirmed cases
- Designate teams to provide care to patients with suspected or confirmed COVID-19
- Minimize face-to-face patient encounters (video monitoring, bundle activities)
- Implement phone triage activities to reduce number of symptomatic patients coming for evaluation
- Extended use of N95 respirators for repeated encounters with different patients

https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhcp%2Frespirator-supply-strategies.html

Patient
Messages:
How to
Avoid
Getting Sick

Stay home when sick

Hand washing & Keep your hands away from your face

Cough/Sneeze etiquette

Avoid contact with people who are sick

Avoid large crowds

Clean high touch surfaces

Wear PPE if caring for household members who have symptoms (gloves, surgical mask)

Patient Messages: What You Should Not Do

- Do not travel to countries with Level 3 Travel Restrictions. Reconsider travel to countries with Level 2 Travel Restrictions.
- Do not use facemasks if you are not sick. CDC does not recommend the use of facemasks for the general public to prevent the spread of COVID-19.
- Beware of stigma. Do not assume that someone of Asian descent is more likely to have COVID-19.
- Persons in the U.S. who have not traveled to affected areas or been in contact with someone with a confirmed or suspected COVID-19 case in the last 14 days are at low risk of becoming sick → that will change with when local transmission begins in the community



Coronavirus Resources

- Centers for Disease Control and Prevention
 - <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
 - Guidance for Healthcare Professionals:
 - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html>
 - Philadelphia Department of Public Health
 - <https://hip.phila.gov/>
 - <https://www.phila.gov/the-latest/>
 - Pennsylvania Department of Health
 - <https://www.health.pa.gov/topics/disease/Pages/Coronavirus.aspx>
- 